DOCUMENT RESUME

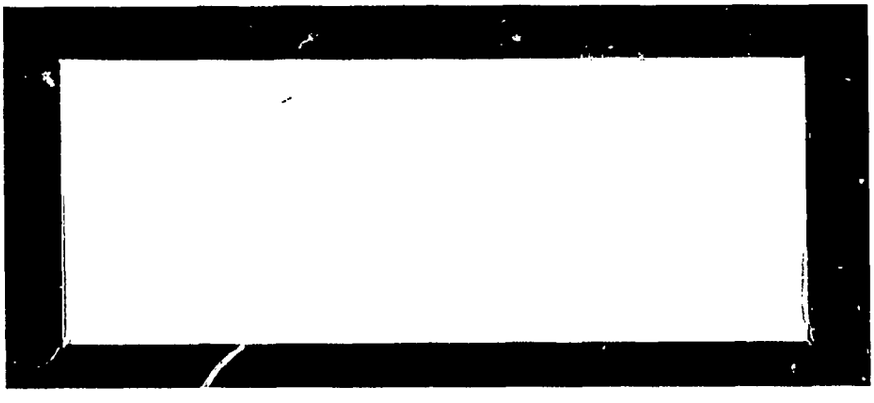
ED 066 313 SE 014 462

| | |
|---|---|
| AUTHOR | Theiss, Frances Case |
| TITLE | Science and Mathematics for Disadvantaged Children: An Annotated Bibliography. |
| INSTITUTION | ERIC Information Analysis Center for Science, Mathematics, and Environmental Education, Columbus, Ohio. |
| PUB DATE | Sep 72 |
| NOTE | 21p.; Special Bibliography 5 |
| EDRS PRICE | MF-$0.65 HC-$3.29 |
| DESCRIPTORS | *Annotated Bibliographies; Bibliographies; *Disadvantaged Youth; Information Services; *Mathematics Education; Reports; Resource Materials; *Science Education |

ABSTRACT

The ERIC Center Science, Math, and Environmental Education Information Reports have been developed to disseminate information concerning documents analyzed at the ERIC Information Analysis Center for Science, Mathematics and Environmental Education, Columbus, Ohio. This annotated bibliography lists the most significant documents that have been published dealing with science and mathematics for disadvantaged children. (CP)





**SMEAC/SCIENCE, MATHEMATICS, AND ENVIRONMENTAL EDUCATION INFORMATION ANALYSIS CENTER**

. . . an information center to organize and disseminate information and materials on science, mathematics, and environmental education to teachers, administrators, supervisors, researchers, and the public. A joint project of The Ohio State University and the Educational Resources Information Center of USOE.

SCIENCE EDUCATION INFORMATION
REPORTS

SPECIAL BIBLIOGRAPHIES

BIBLIOGRAPHY 5

# SCIENCE AND MATHEMATICS FOR DISADVANTAGED CHILDREN: AN ANNOTATED BIBLIOGRAPHY

By Frances Case Theiss
San Jose Unified School District
San Jose, California

THE OHIO STATE UNIVERSITY
ERIC Center for Science, Mathematics,
and Environmental Education
1460 West Lane Avenue
Columbus, Ohio 43221

September, 1972

SPECIAL BIBLIOGRAPHIES - SCIENCE

Special Bibliographies are being developed to announce availability of documents in selected interest areas. These bibliographies indicate documents considered to be useful to teachers, curriculum development personnel, and research personnel. They are aimed primarily, however, at teachers and curriculum personnel.

The bibliographies are developed in areas of demand as indicated by communications received at the ERIC Center for Science, Mathematics, and Environmental Education. We invite your suggestions for areas to be included in this series.

Stanley L. Helgeson
and
Patricia E. Blosser
Editors

Sponsored by the Educational Resources Information Center of the United States Office of Education and The Ohio State University.

This publication was prepared pursuant to a contract with the Office of Education, United States Department of Health, Education, and Welfare. Contractors undertaking such projects under Government sponsorship are encouraged to express freely their judgment in professional and technical matters. Points of view or opinions do not, therefore, necessarily represent official Office of Education position or policy.

## SCIENCE, MATHEMATICS, AND ENVIRONMENTAL EDUCATION INFORMATION REPORTS

The Science, Mathematics, and Environmental Education Information Reports are being developed to disseminate information concerning documents analyzed at the ERIC Information Analysis Center for Science, Mathematics, and Environmental Education. The reports include four types of publications. Special Bibliographies are developed to announce availability of documents in selected interest areas. These bibliographies will list most significant documents that have been published in the interest area. Guides to Resource Literature for Science, Mathematics, and Environmental Education Teachers are bibliographies that identify references for the professional growth of teachers at all levels of science, mathematics, and environmental education. Research Reviews are issued to analyze and synthesize research related to science, mathematics, and environmental education over a period of several years. The Occasional Paper Series is designed to present research reviews and discussions related to specific educational topics.

The Science, Mathematics, and Environmental Education Information Reports will be announced in the SMEAC Newsletters as they become available.

Alford, Roy W., Jr., Ed.D. Teaching Mathematical Concepts to Rural Preschool Children Through a Home-Oriented Program. Dissertation. University of Virginia, 1970. DA31:4373-A.

Purpose of study: to assess the viability of the Appalachia Preschool Education Program as a means of providing sound preschool math experiences.

Altman, Irvin Harold, Ed.D. Teacher-Student Interaction in Inner-City and Advantaged Classes Using the Science Curriculum Improvement Study. Dissertation. UCLA, 1970. DA31:1676-A.

One finding: Advantaged classes, as compared to inner-city classes, were exposed to more verbal cognitive interaction and less verbal-procedural interaction.

Bachrach, Beatrice. "Do Your First Graders Measure Up? (A Report of a Unit With Disadvantaged Learners)." Arithmetic Teacher 16:537-8. November, 1969.

An illustrated plan, listing materials and activities, and listing skills to be developed.

Baillie, John H. "Laboratory Experiences for Disadvantaged Youth in the Middle School." School Science and Mathematics 70(8):704-6. November, 1970.

Discusses a series of 45 supplementary science exercises developed by the author and designed for duplication and distribution to each student for classroom use.

Barbanel, Laura Helen, Ed.D. Operant Discrimination in Middle Class and Lower Class Children. Dissertation. Columbia University, 1969. DA31:405-B.

Ss: 50 G1 students: 25 white middle class and 25 black lower class. One result: The closer a task gets to the biological basis for behavior, the more alike the two populations appear.

Beckmann, Milton W. "Teaching the Low Achiever in Mathematics." Mathematics Teacher 62:443-6. October, 1969.

Describes a workshop held at the University of Nebraska in 1968. Includes a listing of suppliers of free math materials.

Bennett, Lloyd M., Ph.D., and Kay Downing. "Science Education for the Mentally Retarded." Science Education 55(2):155-62. April-June, 1971.

Explores the feasibility of science education and the identification of possible developmental programs of science concepts (scope and sequence) for the educable mentally retarded.

Bennett, Rosemary. "Cecil's Problem." Texas Outlook 53(3):24-5. March, 1969.
According to the author, a psychologist, the child with math difficulties may be dyscalculic.

Berryman, William Clinton, Ed.D. Evaluation of a Program in General Science for Economically Disadvantaged Low Achieving Eighth Grade Students. Dissertation. University of Florida, 1968. DA30:54-A.
Students in experimental classes were provided with a science program with emphasis on concrete objects, events and circumstances.

Bingham, N. Eldred, C. Robert Cronin, and Larry Paulk. "DISCUS, A Demonstration of an Improved Science Curriculum for Underachieving Students." School Science and Mathematics 70(6):527-42. June, 1970.
Describes in detail a demonstration-research project aimed at motivating underachieving inner city junior high school students to turn on to school again through science. Graphs and charts.

Bishop, Maryann, Ph.D. The Effects of Symbolic Reward and Punishment on the Acquisition and Retention of a Discrimination Learning Task in Black and White School Children. Dissertation. University of Pittsburg, 1970. DA32:84-A.
Designed to investigate the relative value of verbal rewards and punishments in facilitating a discrimination learning problem.

Bolger, Philip Albert, Ph.D. The Effect of Teacher Spanish Language Fluency Upon Student Achievement in a Bilingual Science Program. Dissertation. St. Johns University, 1967. DA28:3403-A.
Some conclusions: Bilingual science education for G7 students of Hispanic background resulted in student science achievement significantly different from that of comparable students in the conventional program, but the bilingual program obtained superior results only when conducted by fluent Spanish-speaking science teachers.

Borota, Nicholas and Gladys M. Veitch. "Mathematics for the Learning Laboratory to Teach Basic Skills to Tenth, Eleventh and Twelfth Grades in a Culturally Deprived Area." Mathematics Teacher 63(1):55-6. January, 1970.
The material developed in this program revolved around four major items: fundamental skills, measurement, expression of mathematical ideas, and problem solving.

Bradley, Helen P. "Science: The World Opens for Head Start Children." Science and Children 5:31-2. November, 1967.
Discusses the value of a science program for deprived young children.

Brantley, Betty Conrad, Ph.D. Effect of a Sibling Tutorial Program on the Language and Number Concept Development of Head Start Children. Dissertation. Florida State University, 1970. DA32:300-A.

One conclusion: A relationship between achievement level of tutor and scores of tutees on certain tests was revealed and warrants further study.

Bryant, Napoleon, Jr., Ed.D. The Effects of Performance Objectives on the Achievement Level of Selected Eighth-Grade Science Pupils in Four Predominantly Black Inner City Schools. Dissertation. Indiana University, 1970. DA31:5869-A.

Purpose of study: to determine the effects of expressing course objectives in specific behavioral terms (performance objectives) on the achievement levels of low-achieving pupils.

Burt, Bruce C. "Drawing Conclusions From Samples (An Activity for the Low Achiever)." Arithmetic Teacher 16:539-41. November, 1969.

Lists a number of activities to acquaint the students with probability through the use of already familiar opinion polls. Illustrated.

Carroll, Constance Anne, Ph.D. Low Achievers' Understanding of Four Logical Inference Forms: An Analysis of Difficulties and of the Effect of Instruction. Dissertation. Columbia University, 1970.

Ss: G9 students classified as low achievers in math.

One finding: Ss who had not had instruction in conditional reasoning made significantly more errors on the fallacious arguments than on the valid arguments.

Castanada, Alberta M., Ph.D. The Differential Effectiveness of Two First-Grade Mathematics Programs for Disadvantaged Mexican-American Children. Dissertation. University of Texas, 1967. DA28:3878-A.

In the experimental program, there was an attempt to counterbalance the anticipated ineffectiveness of external motivation with disadvantaged children by capitalizing on the learners' competency drive and on the intrinsic motivation of success and of structured learning.

_____. "A Mathematics Program for Disadvantaged Mexican American First-Grade Children." Arithmetic Teacher 15:413-19. May, 1968.

Presents the rationale for and the content of a mathematics program written for and taught to a group of Mexican-American disadvantaged first-graders. Bibliography.

Chandler, Arnold M. "Mathematics and the Low Achiever." Arithmetic Teacher 17:196-8. March, 1970.

Describes a set of new instructional materials developed by the National Council of Teachers of Mathematics, designed to help low achievers learn mathematics. The project is known as Experiences in Mathematical Ideas.

Churney, Marie A., Ed.D. Vacant Lot Ecology: A Laboratory Block for High School Students. Dissertation. University of Florida, 1970. DA32:266-A.

Vacant city lots are a good resource for inner city science teachers. Author constructed a vacant lot laboratory block, a series of investigations tied together with a discussion of the organisms involved and the ecological roles they play in a vacant city lot.

Citron, Irvin M. and Cyrus W. Barnes. "The Search for More Effective Methods of Teaching High School Biology to Slow Learners Through Interaction Analysis. Part I: The Effects of Varying Teaching Patterns." Journal of Research in Science Teaching 7(1):9-19. 1970.

Purpose of the study: to seek definite relationships between interaction patterns followed in the classroom and the acquisition of science knowledge by slow learners taught by means of a curriculum especially designed for them. Graphs. Tables.

_____ and _____. "The Search for More Effective Methods of Teaching High School Biology to Slow Learners Through Interaction Analysis. Part II: The Effects of Various Constant Teaching Patterns." Journal of Research in Science Teaching 7(1):21-8. 1970.

Objectives of study: to use results of Part I of the study in a research design that would (1) test whether constant patterns of teaching of various types over an extended period could affect concept-formation, problem-solving and total achievement and (2) test whether the achievement trends of Part I could be reversed in these areas.

Clark, Ann D. and Charlotte J. Richards. "Auditory Discrimination Among Economically Disadvantaged and Nondisadvantaged Preschool Children." Exceptional Children 33:259-62. December, 1966.

Results of this study indicated a significant deficiency in auditory discrimination among the economically disadvantaged group.

Cohen, Boaz and Howard L. Jones. "Establishing a Science Curriculum for Aggressive Children." Science Teacher 36(8):61-3. November, 1969.

Discusses the special needs of the aggressive child as a basis upon which to structure the teaching of science.

Cohen, Martin Seymore, Ed.D. A Comparison of Effects of Laboratory and Conventional Mathematics Teaching Upon Underachieving Middle School Boys. Dissertation. Temple University, 1970. DA31:5026-A.

Comparison of mean differences between groups with respect to understanding of concepts showed little difference, but a marked difference in favor of the control group was revealed with respect to computation ability.

Crawford, Alan N. "A Pilot Study of Computer-Assisted Drill and Practice in Seventh Grade Remedial Mathematics." California Journal of Educational Research 21(4):170-81. September, 1970.

The arithmetic section of the Wide Range Achievement Test was used as a pre- and posttest and was judged not to be the best assessment instrument.

Crawford, Matthew William, Ed.D. An Analysis of the Mathematics Curriculum in the Negro Public High Schools in Louisiana. Dissertation. Colorado State College, 1967. DA28:1611-A.

One finding: One-third of all the textbooks used in the schools were listed as "modern" by the Louisiana State Department of Education.

Dahmus, Maurice E. "How to Teach Verbal Problems." School Science and Mathematics 70(2):121-38. February, 1970.

Describes in detail a method referred to as the DPPC method (standing for "direct," "pure," "piecemeal" and "complete"), the key feature of which is its concrete translation of all facts. Includes drawings, classroom samples and a translation test.

Davies, Robert A. "Low Achiever Lesson in Primes." Arithmetic Teacher 16:529-32. November, 1969.

A complete, illustrated lesson plan in primes for low achievers.

Dunson, Charles Kenneth, Ed.D. A Descriptive Analysis of the Mathematics Curriculum in the Predominantly Negro High Schools in the State of Georgia. Dissertation. Colorado State College, 1969. DA30:4138-A.

The 1959 recommendations of the Commission on Mathematics were used as a criterion measure.

The Exceptional Parent. P.O. Box 101, Back Bay Annex, Boston, Mass. 02117.

Started publication in late June of 1971. Aims to provide "practical guidance for the parents of exceptional children." Published by Dr. Lewis Klebanoff, director of the Mass. Dept. of Mental Health; Dr. Stanley D. Klein and Dr. Maxwell J. Schleifer, both of the U. of Mass. Published six times a year. Introductory price: $10.

Friedlander, Bernard Z. "The Bereiter-Engelmann Approach." (Essay review) Educational Forum 32:259-62. March, 1968.

A scholarly and knowledgeable review of the first major publication from the Bereiter and Engelmann preschool project for disadvantaged children. Publication reviewed: Bereiter, Carl and Siegfried Engelmann. Teaching Disadvantaged Children in the Preschool. Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1966.

Gaudia, Gil, Ph.D. Race, Social Class and Age of Achievement of Conservation on Piaget's Tasks. Dissertation. State University of New York at Buffalo, 1970. DA31:5043-A.

A series of standardized conservation tasks, including the conservation of area, number, continuous and discontinuous quantity, weight and mass, were administered to 126 LSES Indian, Negro and white children in G1-3.

George, Kenneth D. and Maureen A. Dietz. "An Experimental Comparison of Urban Children With Suburban Children on Eight Tasks of Basic Skills." Journal of Research in Science Teaching 6(3):224-33. 1969.

The skill differences seemed to depend on the economic background of the children.

Glasser, William, M.D. "Reaching the Unmotivated." Science Teacher 38(3):18-22. March, 1971.

A discussion by Dr. Glasser of his techniques for success-orientation in the schools, adapted from a talk he gave at a science teachers' workshop at Stanford University in the summer of 1970.

Goodfriend, Ronnie Stephanie, Ph.D. Training Effects With Four Year Old Children in Visual Perception Tasks. Dissertation. Columbia University, 1969. DA31: 1073-A.

Ss: 110 pre-K disadvantaged New York City children. The Marianne Frostig Developmental Test of Perception was used in its entirety to obtain all testing results. Study suggests that trained children's performance surpasses their non-trained counterparts.

Gotkin, Lassar G. "A Calendar Curriculum for Disadvantaged Children." Teachers College Record 68:406-17. February, 1967.

"The need to teach concepts related to the regularities of time is fairly obvious — less obvious, however, is the need for specialized approaches which involve presenting these concepts to the lower class child in meaningful ways." Suggests activities.

Green, Robert Wesley. A Survey of the Mathematical Instructional Materials Used in Teaching Culturally Disadvantaged Children Grades 1 Through 6 Throughout the United States. Dissertation. Indiana University, 1969. DA31:1101-A.

Some conclusions: (1) Schools furnished very few materials for teaching mathematics to culturally disadvantaged children. (2) Schools tended to furnish more materials to lower grades than to upper grades.

Grimmett, Sadie A., Ph.D. Problem Solving on the Game Twenty Questions by Males of Four Ethno-Cultural Groups at Two Grade Levels. Dissertation. George Peabody College for Teachers, 1969. DA30:4274-A.

G3 and 6 Appalachian-Caucasian-American, Indian-American, Mexican-American and Black-American males were compared on the game 20 Questions to middle-income Caucasian-American males.

Gussett, James Clayton, Ed.D. The Employment of Non-Standard English in the Development of a Mathematics Course for Seventh-Grade Disadvantaged Students. Dissertation. University of Cincinnati, 1971. DA32:275-A.

Purpose of study: to write a seventh-grade general mathematics course of study for urban ghetto students using non-standard English and also incorporating the customs and general background of the students.

Hall, E. Leona, Ed.D. Methods and Materials of a Mathematics Program for the Disadvantaged and Underachieving Child. Dissertation. Michigan State University, 1966. DA28:154-A.

Two findings: (1) Disadvantaged and underachieving children will respond in a positive manner to the "concept" method of instruction in mathematics as evidenced by gains on an achievement test. (2) Disadvantaged and underachieving children will tend to show a positive relationship between attitude toward mathematics and achievement in mathematics.

Hamilton, Alicita. "A Preschool Program for Children With Limited Hearing." Young Children 21:267-71. May, 1966.

Discusses the Acoupedic Method of "auditory bombardment" for preschool education of hard-of-hearing. Suggests activities.

Hankins, Donald David, Jr., Ph.D. A Fourth Grade Mathematics Program for Children From Impoverished Areas and Its Effect Upon Learning. Dissertation. United States International University, 1969. DA30:2249-A.

Evidence indicates that learning of mathematics by pupils living in disadvantaged areas may be significantly improved when a specifically designed program is utilized.

Henney, Maribeth. "Improving Mathematics Verbal Problem-Solving Ability Through Reading Instruction." Arithmetic Teacher 18(4):223-9. April, 1971.

Suggests that problems without numbers be used for initial instruction in reading math problems. Includes detailed chart of "Completed Steps of Problem Analysis."

Henson, Stanley Joe, Ed.D. A Study of the Science Achievement of Earth Science Curriculum Project Students From Different Socioeconomic Areas. Dissertation. Oklahoma State University, 1970. DA31:5874-A.

318 G9 Ss were used. On the basis of this study, it appears that more appropriate curricula should be provided for lower socioeconomic students in the ESCP.

Herriot, Sarah Florence Tribble, Ed.D. The Secondary School "Slow Learner" in Mathematics. Dissertation. Stanford University, 1967. DA28:3072-A.

Research implication of the study: The study indicated that if the schools' classification of the "slow learner" is used, then these students show a greater gain in achievement in the "new" math when the pace of instruction is less rapid.

Hillerby, Robert Webster, Ph.D. Teaching First Grade Math to Spanish-Speaking Students. Dissertation. UCLA, 1970. DA31:3167-A.

Hypothesis: Spanish-speaking first grade students taught math by a method employing Spanish as well as English would attain a greater measure of achievement in math when tested in English than the achievement of similar students taught in English only.

Houston, Samuel R. and Mary M. Bentzen. "Teaching Effectiveness in Culturally Deprived Junior High Mathematics Classes." Journal of Experimental Education 38(1):73-8. Fall, 1969.

A study designed to investigate the extent to which a policy existed regarding the evaluation by a team of evaluators from the Center of Study for Evaluation of Instructional Programs of 13 teachers participating in an experimental mathematics program at three Demonstration Math Centers in Southern California.

Howard, Vivian Gordon. Teaching Mathematics to the Culturally Deprived and Academically Retarded Rural Child. Dissertation. University of Virginia, 1969. DA31:294-A.

Purpose of study: to determine how experiences, especially prepared for these children and provided in a mathematics laboratory, affect his achievement, self-concept, attitude toward arithmetic, social development, behavior and attendance.

Johnson, Edward P. and Susan C. Winter. "Raising the Achievement Level of Inner City Chemistry Students." Science Teacher 37(6):54. September, 1970.

Science programs, in order to be successful, must be able to change the intellectual environment of the student and free him to see a different, more comprehensive world in which he can live a fuller and more complete life. Such a program is described.

Johnson, Roger Thornten. A Comparison of Categorizing Ability in High and Low Socioeconomic Kindergarteners. Dissertation. University of California, Berkeley, 1969. DA31:225-A.

Purpose: to investigate the basic mental operations of young children which allow them to organize the sensations received from their environment, and the differences and similarities of children from differing SEC backgrounds in their ability to perform these organizations.

Kamii, Constance E. and Norma L. Radin. "A Framework for a Preschool Curriculum Based on Some Piagetian Concepts." Journal of Creative Behavior 1:314-24. 1967. Abstract: PA42:4504.

A conceptual framework for a preschool curriculum is indicated that is particularly geared to the needs of disadvantaged children leading to the development of logical thinking and creativity.

Karnes, Merle B. and others. "An Evaluation of Two Pre-School Programs for Disadvantaged Children: A Traditional and a Highly Structured Preschool." Exceptional Children 34:667-76. May, 1968.

The experimental program proved to be significantly more effective in promoting intellectual functioning, language abilities, perceptual development and school readiness.

Keiffer, Mildred and Sarah Greenholz. "Never Underestimate the Inner-City Child." Mathematics Teacher 63:587-95. November, 1970. (Also in Arithmetic Teacher 17:587-95. November, 1970.)

A thoughtful, informed article which includes detailed suggestions for presentation of math concepts and structure and control in the urban classroom.

Kellough, Richard D. "The Humanistic Approach: An Experiment in the Teaching of Biology to Slow Learners in High School — An Experiment in Classroom Experimentation." Science Education 54(3):253-62. July-September, 1970.

Describes a study in which the majority of the subjects were 15 year olds in grade ten. The case study technique was used.

Kittrell, Flemmie P. "Enriching the Preschool Experience of Children From Age 3." I. The Program. II. The Evaluation (by Jean C. Fuschillo). Children 15:135-43. July, 1968.

Describes a two-year preschool program for disadvantaged children. Children in program experienced IQ rise of 14.6 points over the two-year period compared to an average gain of 4.0 points in the control group.

Klein, Carol Ann, Ph.D. Differences in Science Concepts Held by Children From Three Socio-Economic Levels. Dissertation. University of Minnesota, 1969. DA30:2257-A.

Purpose of study: to determine if children from three socio-economic groups differed in their understanding of selected science concepts and in the methods they would suggest to find answers to questions associated with the concepts. G3 Ss used.

_____. "Differences in Scientific Concepts Held by Children From Three Socio-Economic Levels." School Science and Mathematics 71:550-8. June, 1971.

Paper presented at the March 1970 annual convention of the National Association for Research in Science Teaching — based on the author's doctoral research. (See Klein, above.)

Knowlden, Gayle E., Ed.D. Teaching English Language and Mathematics Symbolism to Verbally Disadvantaged Children. Dissertation. University of California at Los Angeles, 1967. DA27:3623-A.

Detailed lesson plans, filmstrips, video tapes, and other specially prepared materials were furnished to four instructors who conducted experimental programs over a five week period to a total of 80 second-semester low SES kindergarten children.

Lansdown, Branda and Lisa Perhouse. "Insect Interest Transforms a Neighborhood." Science and Children 5:12-13. April, 1968.

Describes a four-week summer animal study project for children of low socioeconomic backgrounds.

Lepper, Robert Earl. A Cross Cultural Investigation of the Relationships Between the Development of Selected Science-Related Concepts and Social Status and Reading Readiness of Negro and White First Graders. Dissertation. Florida State, 1965. DA26:4501.

Piagetian tests used in this study are tasks of conservation of continuous substance, discontinuous substance, number, length and area. Only significant difference found between the three levels of social status was on the task of conservation of continuous substance.

Also in Journal of Research in Science Teaching 5(4):324.

Mangrum, Charles T., II and Carlton W. Knight, II. "Doctoral Dissertation Research in Science and Mathematics Reported for Volume 28 of Dissertation Abstracts." School Science and Mathematics 70(1):37-62. January, 1970.

Includes a 30-entry listing for elementary science and a 54-entry listing for elementary mathematics. Purchase information given. Not annotated.

_____ and _____. "Doctoral Dissertation Research in Science and Mathematics Reported for Volume 29 of Dissertation Abstracts." School Science and Mathematics 71(3):203-26. March, 1971.

Includes sections on elementary science and mathematics. Ordering information given. Not annotated.

Martin, Joanna May, Ed.D. The Effects of Rote and Discovery Teaching Methods on Fifth, Seventh and Ninth Grade Students of Low and Middle Socio-Economic Background. Dissertation. Oklahoma State University, 1970. DA31:5941-A.

Procedure: A mathematics concept was taught by two methods (Discovery and Rote) to two groups for a period of one week. On the final day, the Lomarke-Concept Test was given.

Marusek, John. "A Program Providing Highly Individualized Instruction for Slow Learning Math and Science Students." Science Education 53(3):217-19. April, 1969.

A vital part of this program is a special room set apart for individualized study.

McGlathery, Glenn Edward, Ph.D. An Assessment of Science Achievement of Five- and Six-Year-Old Students of Contrasting Socio-Economic Backgrounds. Dissertation. University of Texas, 1967. DA28:3897-A.

One finding: Where evidence of science achievement required the child to verbalize — such as naming an object — the lower class child did not do as well as the middle class child.

McHune, James Herbert, Ed.D. A Study of the Effects of a Sequence of Skill-Building Activities on a Group of Pre-School Children. Dissertation. Wayne State University, 1970. DA32:96-A.

Purpose of study: to examine the effectiveness of a selected number of skill-building activities on a group of educationally disadvantaged pre-school children. Some skills tested: color naming and associations, number concepts, visual-form discrimination.

McMillan, William B., Ph.D. The Effect of Monetary Reinforcement Upon Mathematics Performance With Sixth Grade Ghetto Children in a Naturalistic Classroom Setting. Dissertation. Southern Illinois University, 1970. DA31:5206-A.

Questionnaire data from parents, students and the teachers indicated that potential philosophical objections to paying students for learning did not materialize with this sample.

Mills, John R. "Aids for Slow Learners of Math." Texas Outlook 53(4):26-7. April, 1969.

The author discusses various uses of games, charts, newspapers and films as aids in teaching math to slow learners.

Moore, Robert. "Silent Teaching as Motivation in Elementary School Mathematics." Academic Therapy Quarterly 3(3):149-54. 1968.

Describes the silent teaching method and its use with children who are language deficient or hyperactive.

Morris, Melvin, Ph.D. Implementation and Evaluation of a Science Program for Rural Educationally Disadvantaged Junior High School Students. Dissertation. University of Florida, 1969. DA31:1145-A.

This was a quasi-experimental study using two different rural Junior High Schools, one as an experimental school and one as a control school.

Moskovitz, Sarah Traister. "Some Assumptions Underlying the Bereiter Approach." Young Children 24:24-32. October, 1968.
A critical evaluation of the Bereiter theories. Bibliography.

Noeske, Nancy R. "Science Program for the Disadvantaged." Science Teacher 37(9):31-2. December, 1970.
Includes a listing of aims and concepts and lesson structures for a G9 activity-centered, Title I-funded science program.

O'Neill, Jane Anne, Ph.D. An Analysis on Selected Variables of the Effect of a Systems Approach to Teaching Specific Mathematics Skills to Fifth Grade Students From a Disadvantaged Area. Dissertation. University of Connecticut, 1970. DA31:6286-A.
One finding: The teacher-text approach was more effective in the area of achievement. An analysis of the time spent on the lessons also indicated that this approach was more efficient.

Paige, Joseph C. "Problems in Teaching Science to the Urban Child." Science Teacher 36(7):27-32. October, 1969.
It is suggested that the weaknesses of the educational establishment present a greater problem than the child's cultural disadvantagement.

Paschal, Billy J. "Mathematical Readiness." Journal of Negro Education 36:78-80. Winter, 1967.
Discusses the role of mathematical readiness activities in preschool programs for disadvantaged children.

Pickering, Charles Thomas, Ph.D. A Study of Intellectual Abilities of Culturally Disadvantaged Children as Predictors of Achievement in Reading, Mathematics and Listening in Grade One. Dissertation. Ohio University, 1969. DA31: 1085-A.
One result of study: Mathematics achievement can be predicted with considerable more accuracy than achievement in reading.

Pinney, Edward L., Jr. "Reading and Arithmetic Scores and EEG Alpha Blocking in Disadvantaged Children." Diseases of the Nervous System 29(6):388-90. 1968.
A study of 100 disadvantaged children indicated that those who are at grade level in both, or above grade level in either reading or arithmetic on the Wide Range Achievement Test are more likely to show alpha blocking on the routine resting EEG than children who scored below grade level.

Poteet, James Allen, Ph.D. Identification Classification and Characteristics of First Grade Students With Learning Disabilities in Reading, Writing and Mathematics. Dissertation. Purdue University, 1970. DA31:3994-A.

Purpose of this study was to gather data relative to effective planning for program development in the area of learning disabilities.

Pribnow, Jack R. "Why Johnny Can't 'Read' Word Problems." School Science and Mathematics 69:591-8. October, 1969.

Presents general steps of solutions to be used for all problems: (1) symbols for the unknowns, (2) equation, (3) solution, (4) interpretation.

Puryear, Ruby Hamilton, Ph.D. The Effect of Direct Teaching on Representational Categorization in Disadvantaged Negro Kindergarten Children. Dissertation. Columbia University, 1970. DA31:3349-A.

One conclusion: Improvements from teaching are not maintained without further practice but are immediately reactivated by appropriate cues after a period of no practice.

Rasmussen, Dean Stewart, Ed.D. Urban Junior High School Mathematics Curricula at the Seventh and Eighth Grade Levels. Dissertation. University of Southern California, 1968. DA29:1688-A.

One conclusion: Emphasis is on teaching for understanding, but drill and incidental learning experiences are used to reinforce concepts and motivation.

Rea, Robert E. and Robert E. Reys. "Mathematical Competencies of Negro and Non-Negro Children Entering School." Journal of Negro Education 40(1):12-16. Winter, 1971.

Findings of study: Kindergarteners from an all Negro community were significantly below the mathematics achievement of both Negro and non-Negro kindergarteners from surrounding municipalities.

Riechard, Donald Edward, Ph.D. The Acquisition of Selected Life-Science Concepts by Beginning Kindergarten Children From Three Different Community Settings. Dissertation. Ohio State University, 1970. DA31:3366-A.

One finding: When sociocultural variables alone were used as predictors, the number of years' education of the subject's mother and the presence of younger siblings were the first and second most useful variables, respectively, in predicting performance on the total and verbal L-SCAT measures.

Rosskopf, Myron F. and Jerome D. Kaplan. "Educating Mathematics Specialists to Teach Children From Disadvantaged Areas." Arithmetic Teacher 15:606-12. November, 1968.

Describes a Master's degree program of the Department of Mathematical Education, Teachers College, Columbia University, for elementary school teachers who want to become specialists in mathematics and the many candidates in the program who direct their attention to the problems of teaching mathematics to disadvantaged children.

Savells, Jerald Owens, Ph.D. A Sociological Analysis of the Relationship Between the Home Environment and Achievement in Mathematics Among a Select Sample of Culturally Disadvantaged Students. Dissertation. Louisiana State University and Agricultural and Mechanical College, 1971. DA32:1098-A.

Some of the independent variables selected for the investigation: mother's education, occupation and evaluation of the local school system, independence training, and mother's emphasis on "mathematical learning" in the home.

Scott, R. and F. F. Lighthall. "Relationship Between Content, Sex, Grade and Degree of Disadvantagedness in Arithmetic Problem Solving." Journal of School Psychology 6(1):61-7. 1967.

Designed to explore relationships between high- (love and belongingness) and low-need (food and shelter) contents on arithmetic problem solving.

Searle, Robert E., Ph.D. Mathematical Abilities Possessed by Kindergarten Children From Disadvantaged Communities. Dissertation. UCLA, 1968. DA29:1735-A.

Major purpose of study: to determine the "amount" and "kind" of mathematical information possessed by children entering K.

Shores, Richard E. and Paul A. Haubrich. "Effect of Cubicles in Educating Emotionally Disturbed Children." Exceptional Children 36(1):21-4. 1969.

A significant difference was found in attending behavior favoring use of the booths, and nonsignificant differences were found with academic behaviors, indicating that attending behavior was increased by utilizing cubicles, but academic rate was not so influenced.

Sonquist, Hanne D. "Applying Some Piagetian Concepts in the Classroom for the Disadvantaged." Young Children 22:231-8+. March, 1967.

Discusses the development of the child's intelligence using a step-by-step approach which facilitated the transition from sensory-motor to conceptual intelligence.

Sugerman, Jule M. "The Headstart Teacher." Instructor 77:27-32. June/July, 1968.

Includes guidelines for developing science and math concepts.

Sweeters, William George, Ph.D. Discovery Oriented Instruction in Science Skills for Educable Mentally Retarded Children. Dissertation. Colorado State College, 1968. DA29:1376-A.

One finding: There was a significant difference in the development of the skill of manipulating variables favoring the experimental over the control group.

Townsend, Ian J. "Science for the Special Child Part I: Introduction and Definition." School Science Review 52:768-71. June, 1971. (A British publication.)

This article, part one of a projected series, defines the problem and the pertinent terms involved. Subsequent articles will show how the problem is being met.

Travers, Kenneth J. "Computation: Low Achievers' Stumbling Block or Stepping Stone?" Arithmetic Teacher 16(7):523-9. November, 1969.

Many aids to computation, such as tables, slide rules and calculators can be put to good use in the classroom. Computational skill may later be emphasized as the child experiences more success in mathematics.

Treviño, Bertha, Ph.D. An Analysis of the Effectiveness of a Bilingual Program in the Teaching of Mathematics in the Primary Grades. Dissertation. University of Texas at Austin, 1968. DA29:521-A.

One conclusion: First graders taught bilingually did significantly better in arithmetic fundamentals, but not in arithmetic reasoning, than did first graders taught exclusively in English.

Vaughn, Abb R. A Study of the Effects of Cultural Disadvantage on Six Problem-Solving Abilities of Ninth Grade Students in General Science. Dissertation. St. Louis University, 1968. DA28:2923-A.

The disadvantaged and non-disadvantaged subjects were equated in reading ability. It was found that culturally disadvantaged students scored significantly better than the non-culturally disadvantaged students in four of the six selected problem solving abilities.

Vitrogan, David. "A Creative Approach to the Teaching of Science to Disadvantaged Children." School Science and Mathematics 70(9):794-804. December, 1970.

Describes an approach which includes the structuring of a language arts experience based on a science activity. Includes purchase information for materials and supplies mentioned.

Wagner, Bartlett Adam, Ph.D. The Responses of Economically Advantaged and Economically Disadvantaged Sixth Grade Pupils to Science Demonstrations. Dissertation. University of Connecticut, 1967. DA28:3086-A.

The findings of the study suggest that disadvantaged pupils understand and can communicate their understanding of science concepts when placed in situations requiring limited verbal response.

Wahla, James Charles, Ph.D. The Relationship Between Sixth-Grade Science Background Experiences and Science Achievement in Selected Urban Elementary Schools. Dissertation. University of Michigan, 1967. DA28:4918-A.

The study shows that background experience is a factor in science achievement, but not at a significant level.

Walbesser, Henry H. and Heather L. Carter. "Acquisition of Elementary Science Behavior by Children of Disadvantaged Families." Educational Leadership 25:741-5+. May, 1968.

Describes research with Science — A Process Approach. Tables. References.

Ward, Robert Leland, Ed.D. The Effect of Instruction and Age on the Classificatory Behavior of Culturally Deprived Preschool Children. Dissertation. Indiana University, 1969. DA30:4294-A.

One finding: Classification instruction using pictured familiar objects resulted in more effective learning than the same instruction employing pictured geometric designs.

Webster, John W. "A Science Program for the Disadvantaged Child." Science Education 54:49-53. January, 1970.

Elementary science can be an excellent medium for motivating and otherwise working with the special problems of disadvantaged children. Successful outcomes will be largely functions of the attitudes, creativity and understanding of the individual teacher.

Weiss, Sol. "What Mathematics Shall We Teach the Low Achiever?" Mathematics Teacher 62:571-5. November, 1969.

Analyzes the results of a questionnaire sent to 200 leading mathematics educators, asking their opinion on what mathematics should be taught to low achievers in the junior high school.

Williams, Macke Albert, Ed.D. Concept Development in Measurement at the Nursery School Level, With a New Manipulative Learning Aid. Dissertation. Colorado State College, 1969. DA30:4166-A.

Population: 21 economically deprived three- and four-year-old children.

Conclusion: These children were able to learn the basic concepts of linear measurement using a manipulative learning aid which reduced measurement abstractions to a level that enabled the child to see size and space relationships in concrete terms.

Wilson, Evelyn. "Urban Education: The Relevant Approach." Science and Children 8(5):11-15. January/February, 1971.

Describes a pilot project undertaken by the Science Education Center of Rutgers University in the summer of 1969 for the purpose of developing a model for science-mathematics education in urban elementary schools.

Winzenread, Marvin Russell, Ed.D. Consumable Materials: A Quasi-Programmed Procedure Experimentally Tested in the Inner City Junior High School Mathematics Classroom. Dissertation. Indiana University, 1969. DA30:4343-A.

One finding: G7 control classes gained significantly more than the G7 experimental classes in achievement in mathematics concepts.

Young, Arnold, Ph.D. Problem Solving in Preschool Children as a Function of Motivation and Type of Reinforcement. Dissertation: Temple University, 1968. DA29:1500-B.

Ss for this study were lower socioeconomic class Negro preschool children.

Zerr, Rita Gregorio, Ph.D. A Comparative Analysis of Selected Variables and Responses of Preschool Children to Science — A Process Approach in New Orleans Child Development Centers. Dissertation. University of Southern Mississippi, 1970. DA31:6435-A.

One recommendation: Evidence indicates there is no reason why Science — A Process Approach should not be used with disadvantaged preschool children.